C1 compositions for stimulating an immune response and methods for identifying cancer-associated nucleic acid and polypeptide molecules.

REMARKS

Although Applicants believe the original abstract of the application to be in compliance with Rule 37 CFR 1.72(b), Applicants have amended the abstract in response to the Examiner's rejection of the abstract in the application as filed. No new matter has been added.

The Office Action Summary for the Office Action mailed March 27, 2002 indicates in sections 4 and 6 that claims 6, 37-40 and 55-67 are pending in the application. Applicants submit that Applicants' amendment filed on October 15, 2001 requested that claims 1-5, 7-36, and 41-56 be cancelled without prejudice. On the basis of that amendment, Applicants assert that the claims that are pending include 6, 37-40, and 57-67.

Applicants gratefully acknowledge the Examiner's withdrawal of the rejections of claims 6, 37-40, 58, 63, and 67 under 35 U.S.C. §112, first paragraph; claims 6 and 38-40 under 35 U.S.C. §112, second paragraph; and claims 6, 37-40, 58, 63, and 67 under U.S.C. §101.

Rejections under 35 U.S.C. §112, Second Paragraph

The Examiner rejected claims 6, 37, and 57-67 under 35 U.S. C. §112, second paragraph. Applicants respectfully traverse the rejection.

The Examiner states that it is unclear whether the nucleic acid in claim 6(a) consists of SEQ ID NOs:8-18 or a sequence complementary thereto and whether SEQ ID NOs:8-18 encodes a cancer-associated antigen. Applicants are unsure why the Examiner questions whether SEQ ID NOs:8-18 are the "at least one second molecule," when claim 6 contains no reference to SEQ ID NOs:8-18, and indeed there are only eight sequences set forth in the application (SEQ ID NO:1-8). Applicants submit that the claim as written contains no reference to SEQ ID NOs:8-18 and therefore the nucleic acid need not consist of SEQ ID NOs:8-18 or a sequence complementary thereto. Applicants respectfully note that the language of claim 6(a) describes nucleic acid molecules that encode a cancer-associated antigen. These nucleic acid molecules also include a nucleotide sequence, the complement of which hybridizes under stringent conditions to at least one additional nucleic acid molecule that includes a nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NOs:1-5. Applicants believe this language to be clear and to distinctly claim the subject matter of the invention.

Claim 37 recites "stimulating an immune response to at least one protein." The Examiner finds this to be indefinite "as it is not clear how to stimulate an immune response in at least one protein." Applicants are unclear of the meaning of stimulating an immune response *in* at least one protein. Applicants respectfully submit that the specification provides information regarding standard methods of stimulating an immune response to a protein, and that this description obviates the grounds for the Examiner's rejection of claim 37. For example, the specification at page 14, lines 11-16 provides a description of a standard procedure to stimulate an immune response to a protein. These methods, which are known to those of ordinary skill in the art, include the administration of a protein, or an immunogenic peptide derived therefrom in an amount sufficient to provoke or augment an immune response. Such a method would be well within the ability of one of ordinary skill in the art. Claim 37 recites stimulating an immune response to at least one protein, which Applicants respectfully contend is not indefinite, but is clear to one of ordinary skill in the art.

Applicants respectfully request the Examiner reconsider and withdraw the rejection made under 35 U.S.C. §112, second paragraph.

Rejections under 35 U.S.C. §112, First Paragraph

The Examiner rejected claims 6 and 57-61 under 35 U.S.C. §112, first paragraph as not enabled. Applicants respectfully traverse the rejection.

The Examiner states that because SEQ ID NOs:1-5 are not specifically identified as clones NY-Co-8, 9, 13, 16, 20, and 39, it would require undue experimentation for one to know how to use the invention. Applicants respectfully disagree. Each of the sequences set forth as SEQ ID NOs:1-5 is identified in the application as a molecule that encodes a cancer-associated antigen. Thus, the specification teaches that these five nucleic acid sequences encode proteins that are the isolated cancer-associated protein molecules of claim 6, and are used in the compositions of the claimed invention. The utility of the proteins and nucleic acid molecules of the invention is not dependent on knowledge of the NY-Co clone number identification of a sequence. Applicants have provided the nucleotide sequence of each of the nucleic acid molecules set forth as SEQ ID NOs:1-5, and teach uses for the molecules as well as how to use them to practice the invention. Therefore, one of ordinary skill in the art would be able to make and use these nucleic acid molecules and the proteins they encode as claimed in the invention

using only routine experimentation. Such a determination would be considered routine for one of ordinary skill in the art.

The Examiner has rejected claims 37-40 and 62-67 under 35 U.S.C. §112, first paragraph as not enabled. Applicants respectfully traverse the rejection.

The Examiner states that there is no guidance or exemplification of which condition(s) characterized by expression of one or more proteins may be treated by stimulation of an immune response and therefore undue experimentation would be required to practice the invention. Applicants respectfully submit that claim 37, from which claims 38-40 and 62-67 depend, recites a composition of matter useful in stimulating an immune response to at least one protein encoded by a nucleic acid molecule comprising a nucleotide sequence set forth in SEQ ID NOs: 1-5. The claim embraces stimulation of an immune response with a protein encoded by these sequences, and Applicants provide the sequences and examples of their use to stimulate an immune response. Thus, Applicants submit that the specification provides sufficient guidance to enable one of ordinary skill in the art to make and use the molecules of the invention utilizing only ordinary experimentation.

The claims at issue do not include use of the composition of matter in a method of treating a disorder. There are numerous reasons one of ordinary skill in the art would use a protein encoded by one of the molecules set forth as SEQ ID NOs:1-5 to stimulate an immune response, for example: to create an animal or cell model, to examine mechanistic models of a disorder, or to treat a disorder. Applicants respectfully contend that the specific naming of a condition to be treated is not required to enable the claims at issue, which relate to a composition to stimulate an immune response in a subject. Even if naming a specific condition were required for enablement of these claims, Applicants submit that the specification clearly describes the expression of the molecules of the invention in cancer, which would indicate to one of ordinary skill in the art that one possible use for the claimed invention is for the treatment of cancer.

The Examiner has rejected claims 6 and 37-40 under 35 U.S.C. §112, first paragraph as not enabled. Applicants respectfully traverse the rejection.

The Examiner states that there is no evidence in the specification that indicates the translation of SEQ ID NOs: 1-5 into protein. In forming this conclusion, the Examiner may not have considered that, as described in the specification, the nucleic acids referenced in the claims were isolated using SEREX methodology. The SEREX method uses antibodies found in patient sera to clone sequences that encode proteins recognized by the antibodies. Therefore, the nucleic

acids must have been actually translated into proteins because the antibodies were produced in patients in response to the expression of the proteins. Without expression of the proteins, the cancer patients' sera would not contain specific antibodies that recognize the proteins. Therefore, Applicants have shown SEQ ID NOs:1-5 are expressed. Because SEQ ID NOs:1-5 are translated into protein, it would therefore not be unpredictable to use the invention as claimed.

The Examiner also states at the end of paragraph 10, that "one of skill in the art would not know how to use the invention as claimed because it is unpredictable whether the nucleic acids of SEQ ID NOs:8-18 were in fact translated protein." Applicants note that only SEQ ID NOs:1-5 are referenced in the claims at issue and assume that the reference to SEQ ID NOs:8-18 was a typographical error.

The Examiner rejected claims 6, 37-40, and 57-67 under 35 U.S.C. §112, first paragraph as lacking an adequate written description. Applicants respectfully traverse the rejection.

The Examiner states that "there are no examples disclosed that conveys [sic] to one of ordinary skill in the art that the applicant was in possession of the claimed proteins, nucleic acid degenerates or complements thereof to SEQ ID NO:1-5 and composition comprising proteins." (Paper 12, page 5, paragraph 11). Applicants submit that the claims at issue encompass the protein and compositions comprising proteins, and these are described in a way that clearly indicates possession by Applicants.

As the Examiner has indicated, the invention is drawn to a protein, which is encoded by these nucleic acid molecules set forth as SEQ ID NOs:1-5 or by molecules complementary to, or degenerates of, these molecules. Applicants are not claiming the degenerate nucleic acids or complement molecules themselves. In accordance with the holding in *Vas-Cath Inc. v. Mahurkar* 935 F.2d 1555, 19 USPQ2d 1111 (Fed. Cir. 1991), Applicants are required to demonstrate that they were in possession of the protein of the invention, and submit that they have done so and that they have also shown possession of nucleic acid molecules SEQ ID NOs:1-5, which encode the cancer-associated proteins of the invention. One of skill in the art could readily visualize or recognize the identity of members of the claimed genus of nucleic acid molecules related to SEQ ID NOs: 1-5, therefore, one of ordinary skill in the art would know that Applicants, having provided specific nucleotide sequences and teachings regarding isolation of nucleic acids having such sequences, were in possession of the invention as of the time of filing of the application. In addition, Applicants respectfully submit that they are not claiming all

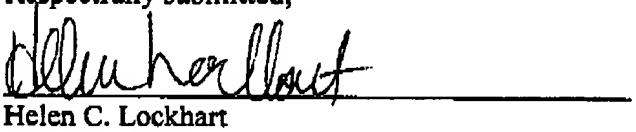
degenerate or complementary nucleic acids, and are not required to demonstrate possession of the degenerate or complementary nucleic acid molecules of claim 6.

The examiner also has based the rejection in part on the contention that "there is no actual reduction to practice, sufficient descriptive information, such as definitive structure features, which are critical to polypeptide activity." Applicants respectfully submit that there is no requirement to show polypeptide activity or features critical to polypeptide activity to reduce to practice the claimed invention. The claimed invention relates to the identification of proteins that are expressed in cancer. The claims do not require activity of the claimed proteins, therefore, Applicants believe that structural features of the claimed proteins are not relevant or required to show possession of the claimed invention.

As detailed above, the proteins of the invention were obtained via SEREX, are expressed, and can be encoded by the listed sequences (SEQ ID NOs:1-5) or by degenerates as one of ordinary skill in the art would readily appreciate. The specification provides sequences of nucleic acid molecules that encode the proteins along with methods of using these molecules in the practice of the invention. Applicants respectfully submit that sufficient detail has been presented to demonstrate to one of ordinary skill in the art that Applicants were in possession of the claimed invention at the time of filing. Therefore, Applicants respectfully request the Examiner reconsider and withdraw the rejection made under 35 U.S.C. 112, first paragraph

In view of the foregoing, Applicants respectfully request that the Examiner withdraw the rejections and act favorably upon the claims.

Respectfully submitted,



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Marked-up Specification

Page 29, lines 2-3

Various molecules associated with disorders such as [colon]cancer are disclosed. The invention also discloses diagnostic and therapeutic methods based upon these molecules, as well as compositions for stimulating an immune response and methods for identifying cancer-associated nucleic acid and polypeptide molecules.